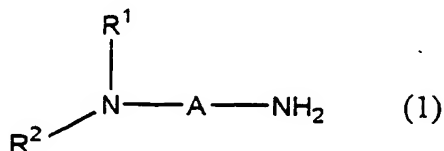


WHAT IS CLAIMED IS:

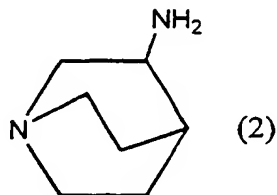
1. A method for producing a polyurethane resin, which comprises reacting a polyol with a polyisocyanate in the presence of a catalyst selected from the group consisting
5 of a catalyst (A) containing an amine compound of the following formula (1):



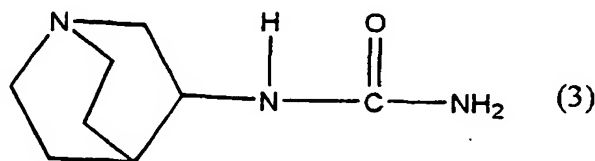
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wherein each of R^1 and R^2 which are independent of each other, is a C_{1-4} alkyl group, and A is a C_{5-10} straight chain or branched chain alkylene group;

- a catalyst (B) containing an amine compound of the
15 following formula (2):

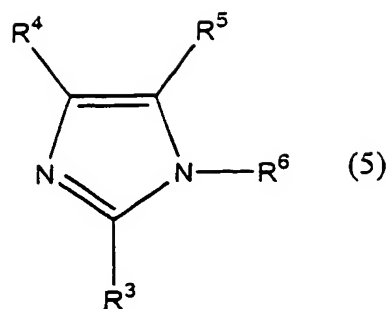


- 20 a catalyst (C) containing an amine compound of the following formula (3):

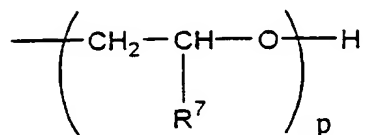


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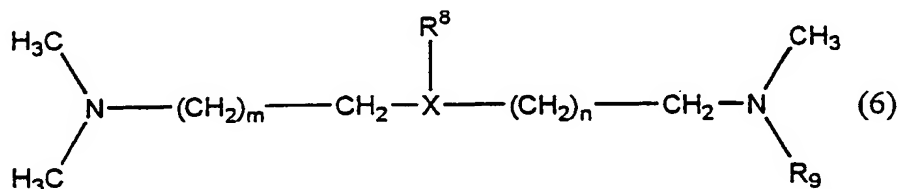
a catalyst (D) containing a compound of the following formula (5):



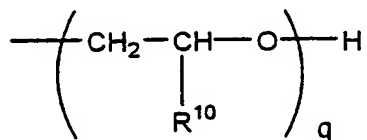
wherein each of R^3 , R^4 and R^5 which are independent of one another, is a hydrogen atom or a C_{1-4} alkyl group, R^6 is a hydrogen atom, a functional group of the following formula:



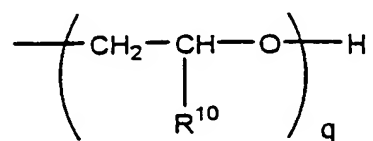
wherein R^7 is a hydrogen atom or a C_{1-4} alkyl group, and p is an integer of from 1 to 3, or a 3-aminopropyl group, and an amine compound of the following formula (6):



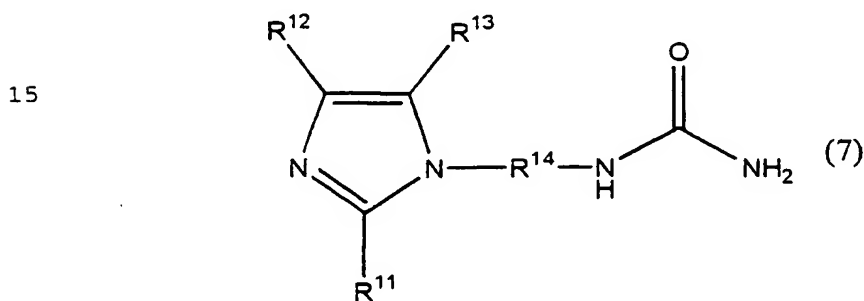
wherein X is a nitrogen atom or an oxygen atom, each of R^8 and R^9 which are independent of each other, is a methyl group or a functional group of the following formula:



wherein R¹⁰ is a hydrogen atom or a C₁₋₄ alkyl group, and q is an integer of from 1 to 3, and each of m and n is an integer of from 1 to 2, provided that when X is a nitrogen atom, R⁸ and R⁹ are not simultaneously methyl groups, and that when X is an oxygen atom, R⁹ is a functional group of the following formula:



10 wherein R¹⁰ is a hydrogen atom or a C₁₋₄ alkyl group, and
q is an integer of from 1 to 3; and
a catalyst (E) containing an amine compound of the
following formula (7):

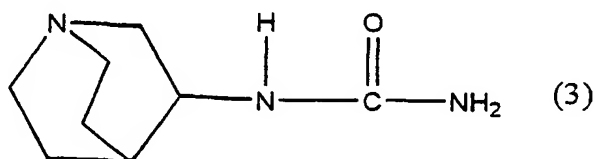


wherein each of R^{11} , R^{12} and R^{13} which are independent of
20 one another, is a hydrogen atom or a C_{1-4} straight chain
or branched chain alkyl group, and R^{14} is a C_{1-4} straight
chain or branched chain alkylene group.

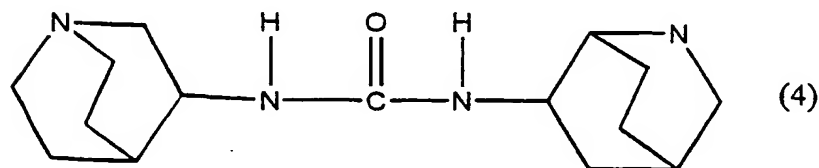
2. A method for producing a polyurethane foam, which comprises reacting a polyol with a polyisocyanate by using water and/or a low-boiling point organic compound as a blowing agent in the presence of the catalyst as defined in Claim 1.

3. The production method according to Claim 1, wherein the catalyst (A) contains as the amine compound of the formula (1), an amine compound selected from the group consisting of N,N-dimethylpentamethylenediamine, N,N-
5 dimethylhexamethylenediamine, N,N-dimethyloctamethylenediamine and N,N-dimethyldecamethylenediamine.

4. The production method according to Claim 1, wherein the catalyst (C) contains an amine compound of the
10 following formula (3):



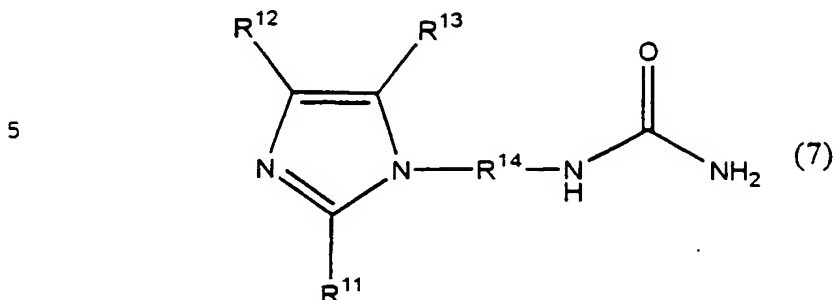
15 and an amine compound of the following formula (4):



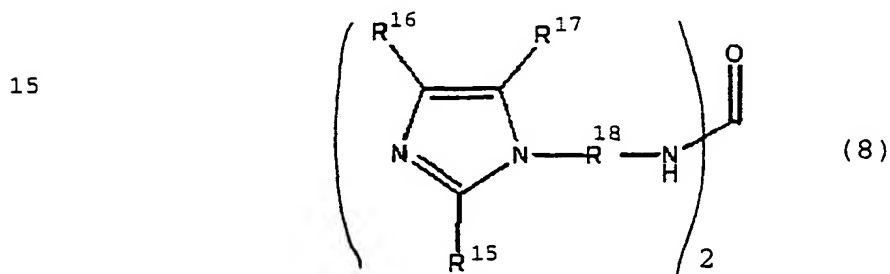
20 5. The production method according to Claim 1, wherein the catalyst (D) contains as the amine compound of the formula (5), an amine compound selected from the group consisting of 1-(2'-hydroxypropyl)-imidazol, 1-(2'-hydroxypropyl)-2-methylimidazol, 1-(2'-hydroxyethyl)-
25 imidazol, 1-(2'-hydroxyethyl)-2-methylimidazol, 1-(3'-aminopropyl)-imidazol and 1-(3'-aminopropyl)-2-methylimidazol.

6. The production method according to Claim 1, wherein the catalyst (D) contains as the compound of the formula (6), an amine compound selected from the group consisting of N-(2-hydroxyethyl)-N,N',N'',N'''-
5 tetramethyldiethylenetriamine, N'-(2-hydroxyethyl)-N,N,N'',N'''-tetramethyldiethylenetriamine, N-(2-hydroxypropyl)-N,N',N'',N'''-tetramethyldiethylenetriamine, N'-(2-hydroxypropyl)-N,N,N'',N'''-
tetramethyldiethylenetriamine, N'-(2-hydroxypropyl)-
10 N,N,N'-trimethyl-bis(2-aminoethyl) ether and N'-(2-hydroxyethyl)-N,N,N'-trimethyl-bis(2-aminoethyl) ether.
7. The production method according to Claim 1, wherein in the catalyst (D), the proportion of the amine compound
15 of the formula (5) to the amine compound of the formula (6) is from 1/9 to 9/1 by a weight ratio.
8. The production method according to Claim 1, wherein in the catalyst (E), the amine compound of the formula (7) is an amine compound wherein R¹¹ is a hydrogen atom
20 or a methyl group, each of R¹² and R¹³ is hydrogen, and R¹⁴ is a propylene group.
9. The production method according to Claim 1, wherein the catalyst (E) contains as the amine compound of the formula (7), an amine compound selected from the group
25 consisting of 1-{3'-(imidazolinyl)propyl}urea and 1-{3'-(2''-methyylimidazolinyl)propyl}urea.
10. The production method according to Claim 1, wherein

the catalyst (E) contains an amine compound of the following formula (7):



wherein each of R^{11} , R^{12} and R^{13} which are independent of
 10 one another, is a hydrogen atom or a C_{1-4} straight chain
 or branched chain alkyl group, and R^{14} is a C_{1-4} straight
 chain or branched chain alkylene group, and a compound of
 the following formula (8):



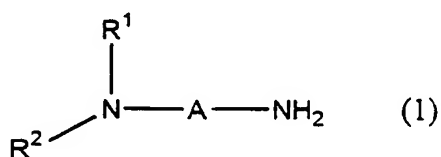
wherein each of R^{15} , R^{16} and R^{17} which are independent of
 20 one another, is a hydrogen atom or a C_{1-4} straight chain
 or branched chain alkyl group, and R^{18} is a C_{1-4} straight
 chain or branched chain alkylene group.

11. The production method according to Claim 10, wherein
 the amine compound of the formula (8) is an amine
 25 compound wherein R^5 is a hydrogen atom or a methyl group,
 each of R^6 and R^7 is hydrogen, and R^8 is a propylene group.

12. The production method according to Claim 10, wherein

the amine compound of the formula (8) is an amine compound selected from the group consisting of 1,3-bis(3'-(imidazoliny1)propylurea and 1,3-bis(3'-(2''-methylimidazoliny1)propyl)urea.

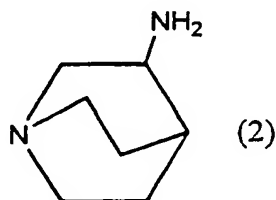
13. A catalyst for production of a polyurethane resin, which contains an amine compound of the following formula (1):



wherein each of R^1 and R^2 which are independent of each other, is a C_{1-4} alkyl group, and A is a C_{5-10} straight chain or branched chain alkylene group.

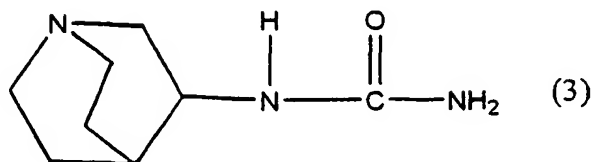
14. The catalyst for production of a polyurethane resin according to Claim 13, wherein the the amine compound of the formula (1) is an amine compound selected from the group consisting of N,N-dimethylpentamethylenediamine, N,N-dimethylhexamethylenediamine, N,N-dimethyloctamethylenediamine and N,N-dimethyldecamethylenediamine.

15. A catalyst for production of a polyurethane resin, which contains an amine compound of the following formula (2):

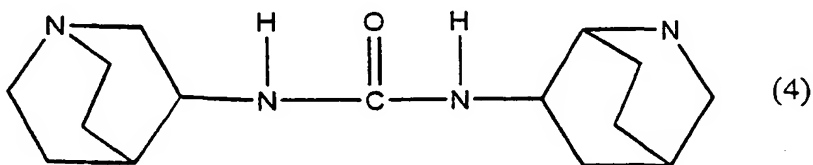


16. A catalyst for production of a polyurethane resin,
which contains an amine compound of the following formula
(3):

5

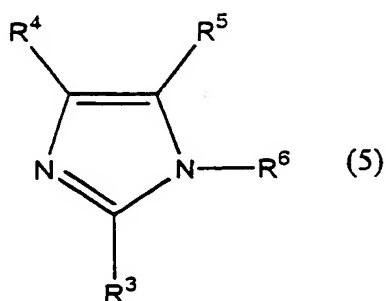


17. The catalyst for production of a polyurethane resin
according to Claim 16, which further contains an amine
10 compound of the following formula (4):

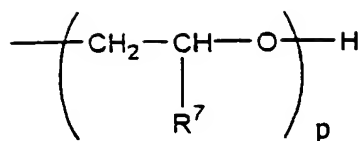


15 18. A catalyst for production of a polyurethane resin,
which contains a compound of the following formula (5):

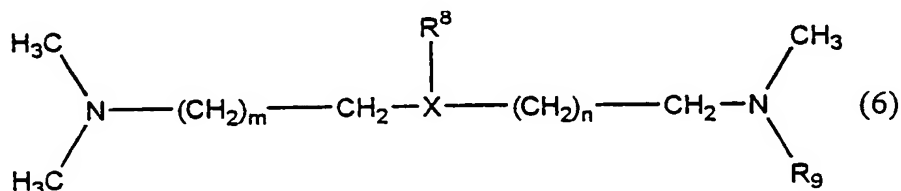
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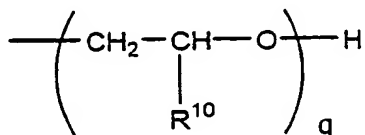
wherein each of R^3 , R^4 and R^5 which are independent of one
another, is a hydrogen atom or a C_{1-4} alkyl group, R^6 is a
hydrogen atom, a functional group of the following
25 formula:



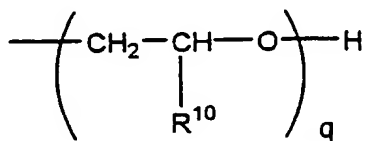
wherein R^7 is a hydrogen atom or a C_{1-4} alkyl group, and p is an integer of from 1 to 3, or a 3-aminopropyl group; and an amine compound of the following formula (6):



wherein X is a nitrogen atom or an oxygen atom, each of R^8 and R^9 which are independent of each other, is a methyl group or a functional group of the following formula:



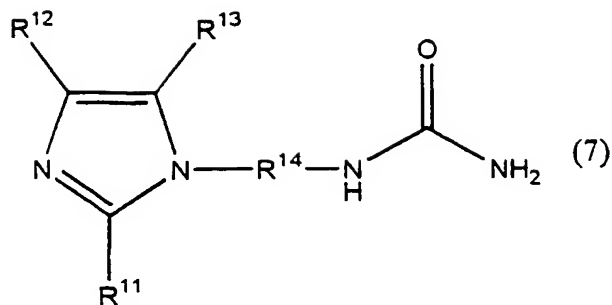
wherein R^{10} is a hydrogen atom or a C_{1-4} alkyl group and q is an integer of from 1 to 3, and each of m and n is an integer of from 1 to 2, provided that when X is a nitrogen atom, R^8 and R^9 are not simultaneously methyl groups, and that when X is an oxygen atom, R^9 is a functional group of the following formula:



wherein R^{10} is a hydrogen atom or a C_{1-4} alkyl group, and

q is an integer of from 1 to 3.

19. The catalyst for production of a polyurethane resin according to Claim 18, wherein the amine compound of the formula (5) is an amine compound selected from the group consisting of 1-(2'-hydroxypropyl)-imidazol, 1-(2'-hydroxypropyl)-2-methylimidazol, 1-(2'-hydroxyethyl)-imidazol, 1-(2'-hydroxyethyl)-2-methylimidazol, 1-(3'-aminopropyl)-imidazol and 1-(3'-aminopropyl)-2-methylimidazol.
20. The catalyst for production of a polyurethane resin according to Claim 18, wherein the amine compound of the formula (6) is an amine compound selected from the group consisting of N-(2-hydroxyethyl)-N,N',N'',N''-tetramethyldiethylenetriamine, N'-(2-hydroxyethyl)-N,N,N'',N''-tetramethyldiethylenetriamine, N-(2-hydroxypropyl)-N,N',N'',N''-tetramethyldiethylenetriamine, N'-(2-hydroxypropyl)-N,N,N'',N''-tetramethyldiethylenetriamine, N'-(2-hydroxypropyl)-N,N,N'-trimethyl-bis(2-aminoethyl)ether and N'-(2-hydroxyethyl)-N,N,N',N'-trimethyl-bis(2-aminoethyl) ether.
21. The catalyst for production of a polyurethane resin according to Claim 18, wherein the proportion of the amine compound of the formula (5) to the amine compound of the formula (6) is from 1/9 to 9/1 by a weight ratio.
22. A catalyst for production of a polyurethane resin, which contains an amine compound of the following formula (7):

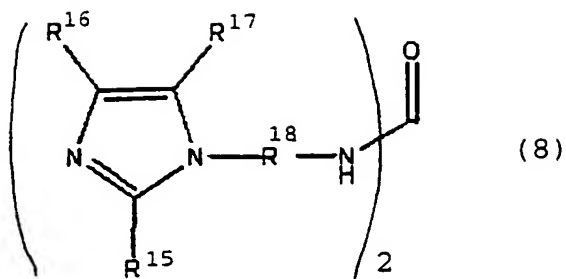


wherein each of R¹¹, R¹² and R¹³ which are independent of one another, is a hydrogen atom or a C₁₋₄ straight chain or branched chain alkyl group, and R¹⁴ is a C₁₋₄ straight chain or branched chain alkylene group.

23. The catalyst for production of a polyurethane resin according to Claim 22, wherein the amine compound of the formula (7) is an amine compound wherein R¹¹ is a hydrogen atom or a methyl group, each of R¹² and R¹³ is hydrogen, and R¹⁴ is a propylene group.

24. The catalyst for production of a polyurethane resin according to Claim 22, wherein the amine compound of the formula (7) is an amine compound selected from the group consisting of 1-(3'-(imidazolinyl)propyl)urea and 1-(3'-(2''-methylimidazolinyl)propyl)urea.

25. The catalyst for production of a polyurethane resin according to Claim 22, which further contains a compound of the following formula (8):



5

wherein each of R^{15} , R^{16} and R^{17} which are independent of one another, is a hydrogen atom or a C_{1-4} straight chain or branched chain alkyl group, and R^{18} is a C_{1-4} straight chain or branched chain alkylene group.

- 10 26. The catalyst for production of a polyurethane resin according to Claim 25, wherein the compound of the formula (8) is a compound wherein R^{15} is a hydrogen atom or a methyl group, each of R^{16} and R^{17} is hydrogen, and R^{18} is a propylene group.
- 15 27. The catalyst for production of a polyurethane resin according to Claim 25, wherein the amine compound of the formula (8) is an amine compound selected from the group consisting of 1,3-bis{3'-(imidazolinyl)propyl}urea and 1,3-bis{3'-(2''-methylimidazolinyl)propyl}urea.

20